FIG. 1

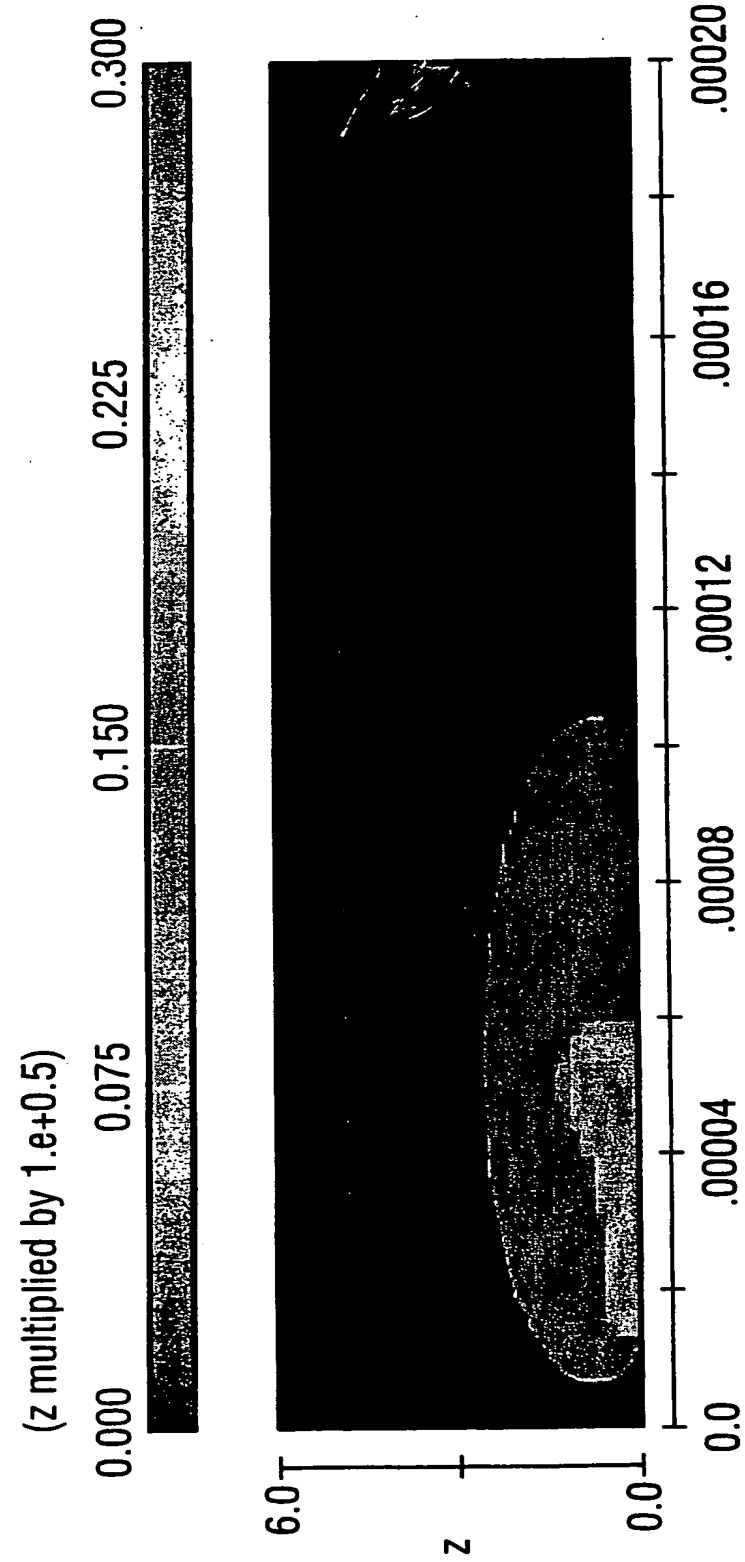
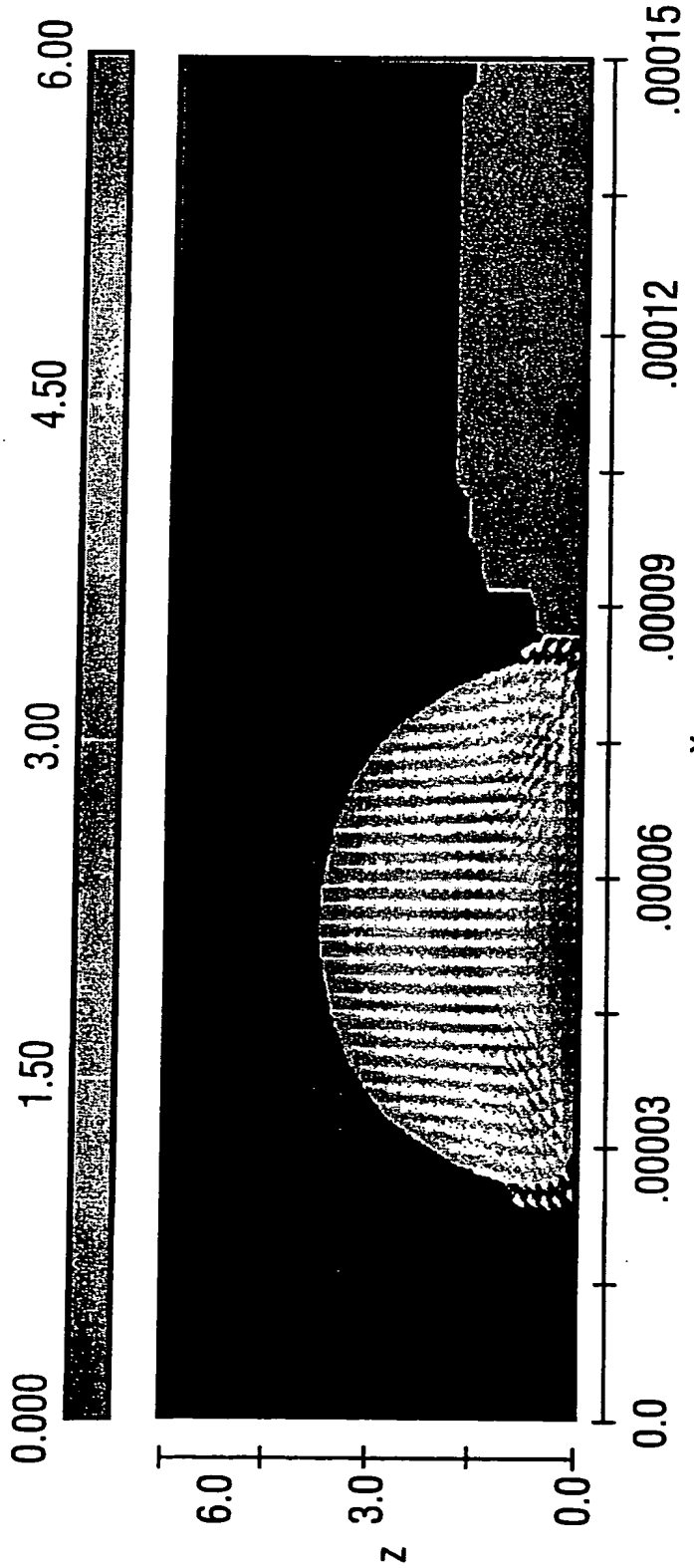

Velocity magnitude contours
(z multiplied by 1.e+0.5)
0.000
0.075
0.150
0.225
0.300
6.0
0.0
z
0.0
.00004
.00008
.00012
.00016
.00020
x
Flow-3D t=9.9988E-06 y=5.000E-01 (ix=2 to 101 kz=2 to 31)
17:56:04 2- 9-1999eifd hydr3D: version 7.1.5 win 32 1998
51.1 dia : 000 to 250 microseconds

FIG. 2a


Velocity 250 to 263 microseconds (vmax=5.50E+00)
(z multiplied by 1.e+0.5)
0.000
1.50
3.00
4.50
6.00
6.0
3.0
0.0
z
0.0
.00003
.00006
.00009
.00012
.00015
x
Flow-3D t=3.0000E-06 y=1.000E-06 (ix=2 to 76 kz=2 to 31)
17:30:04 2- 17-1999eifd hydr3D: version 7.1.5 win 32 1998
51.1 dia : Fluid droplet impact with solidified droplet 3D

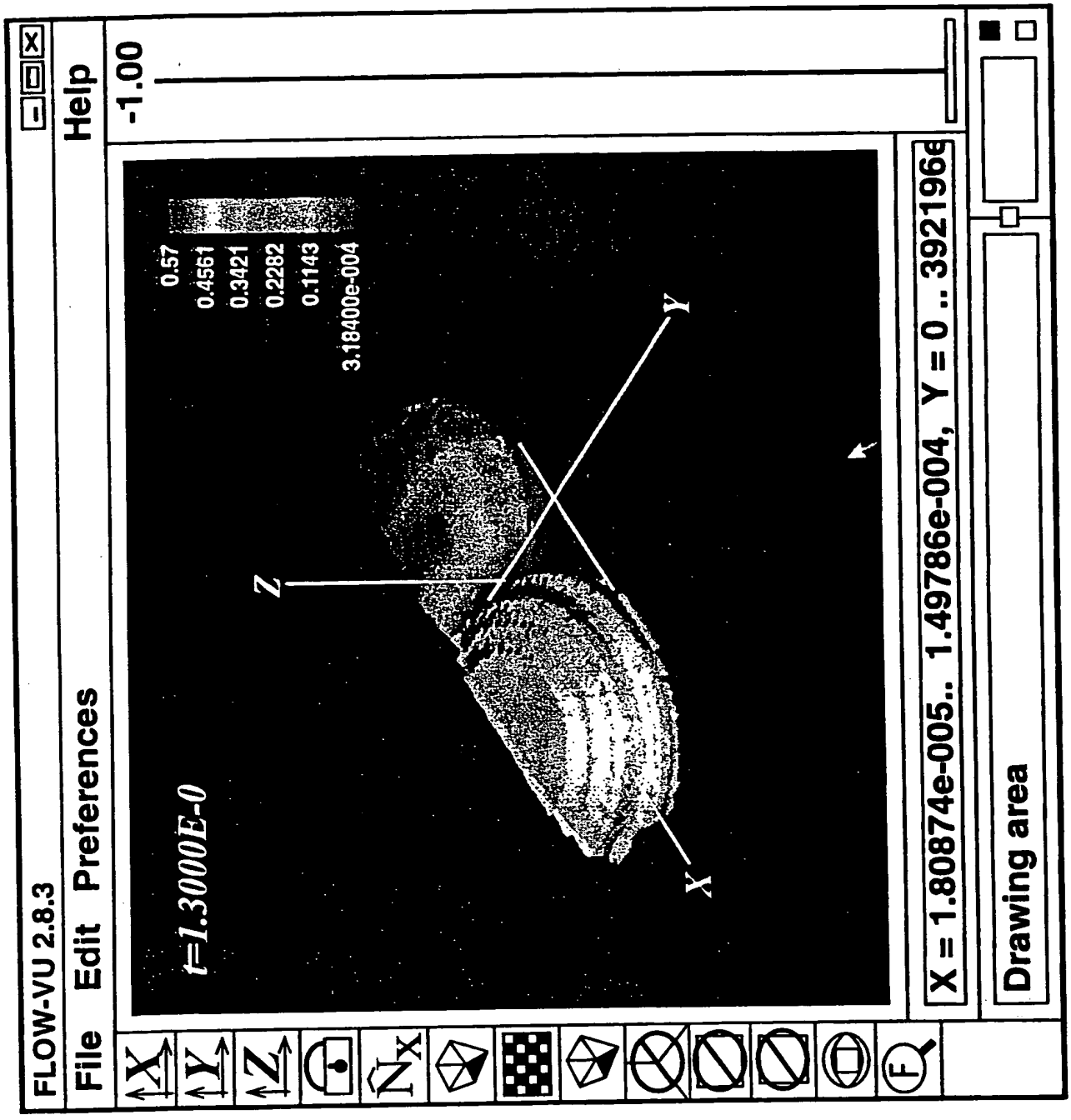

FLOW-VU 2.8.3
File Edit Preferences Help
-1.00
0.57
0.4561
0.3421
0.2282
0.1143
3.18400e-004
t=1.3000E-0
Z
Y
X
X = 1.80874e-005.. 1.49786e-004, Y = 0 .. 392196
Drawing area

FIG. 2b

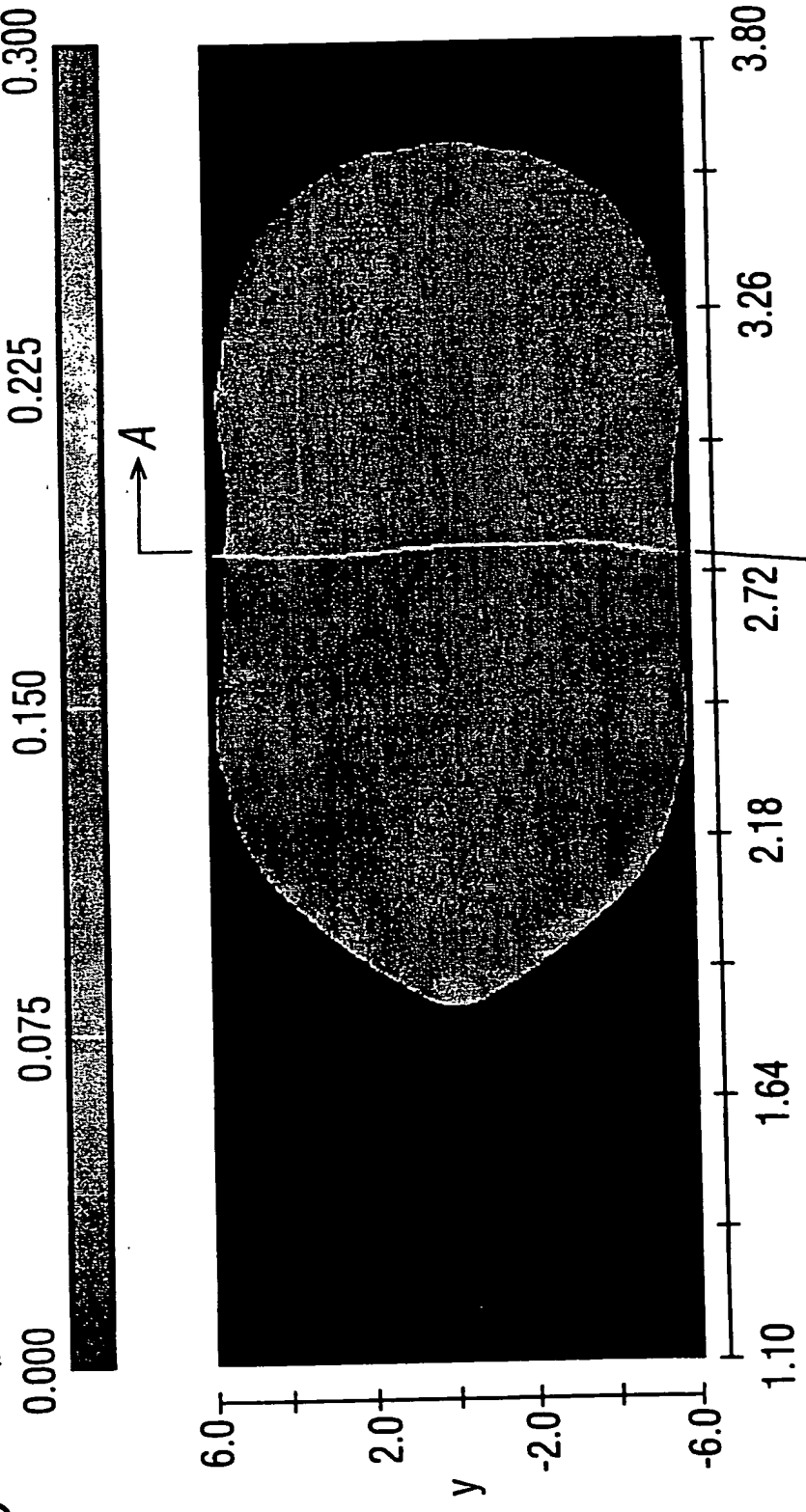
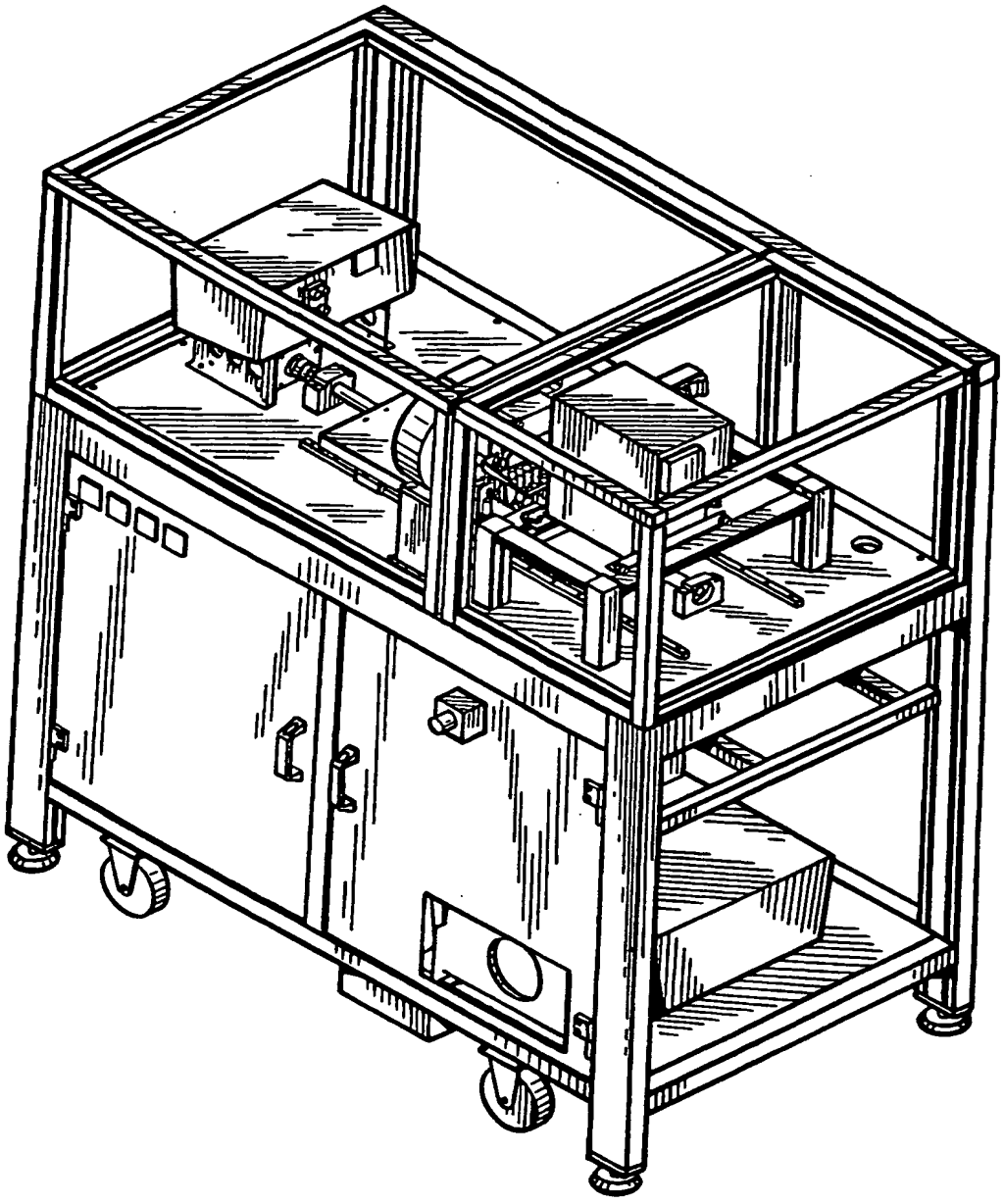

Section A-A
Plan of droplet substrate boundary at t=930 microseconds
(y multiplied by 1.e+0.5)
0.000
0.075
0.150
0.225
0.300
A
A
6.0
2.0
-2.0
-6.0
y
1.10
1.64
2.18
2.72
3.26
3.80
x (x 1.e+04)
Flow-3D t=6.809E-04 z=1.000E-06 (ix=2 to 136 jy=2 to 31)
20:04:05 2- 17-1999eifd hydr3D: version 7.1.5 win 32 1998
51.1 dia : 675 to 975 microseconds - 3D droplets

FIG. 3

FIG. 4



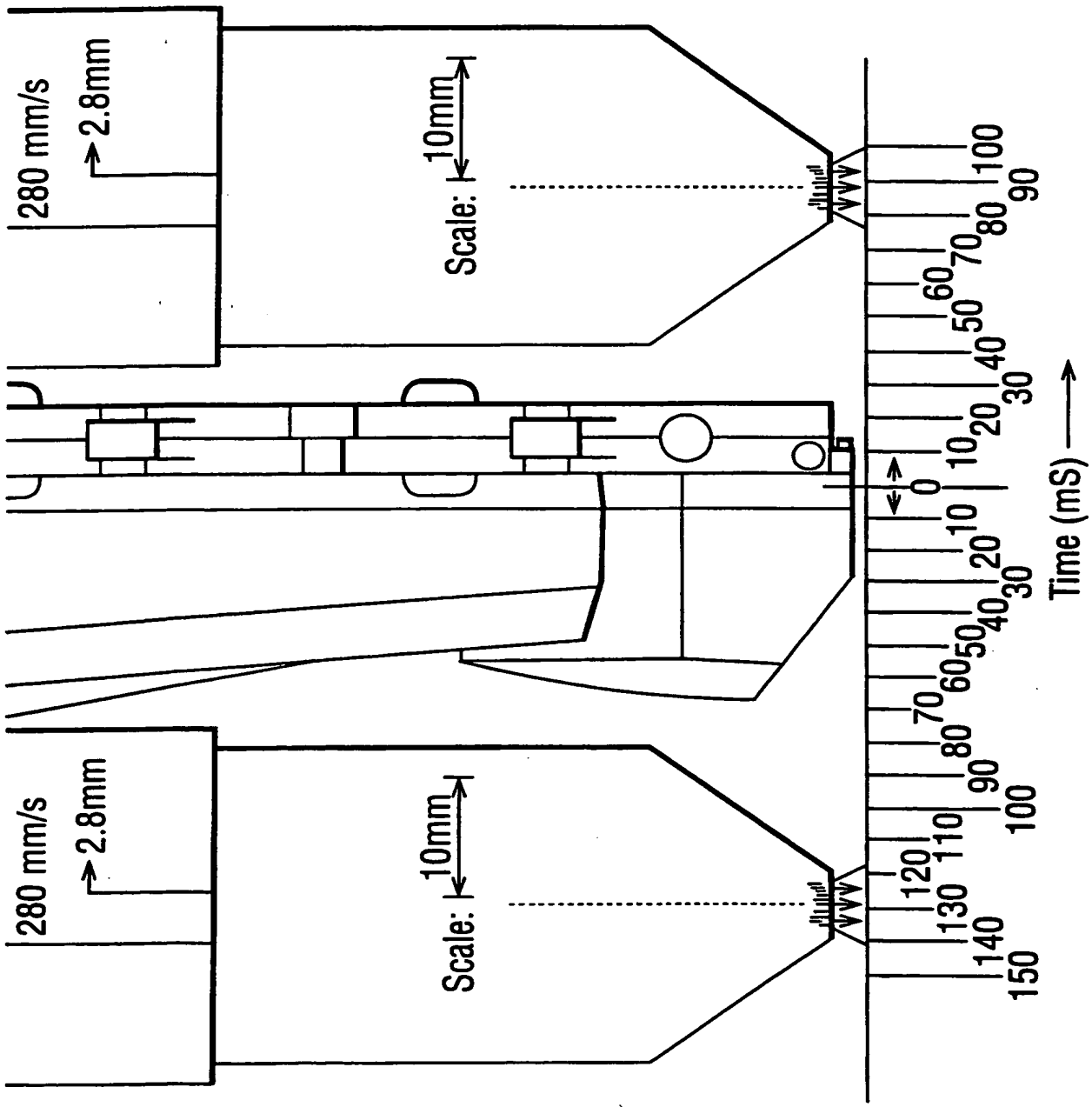
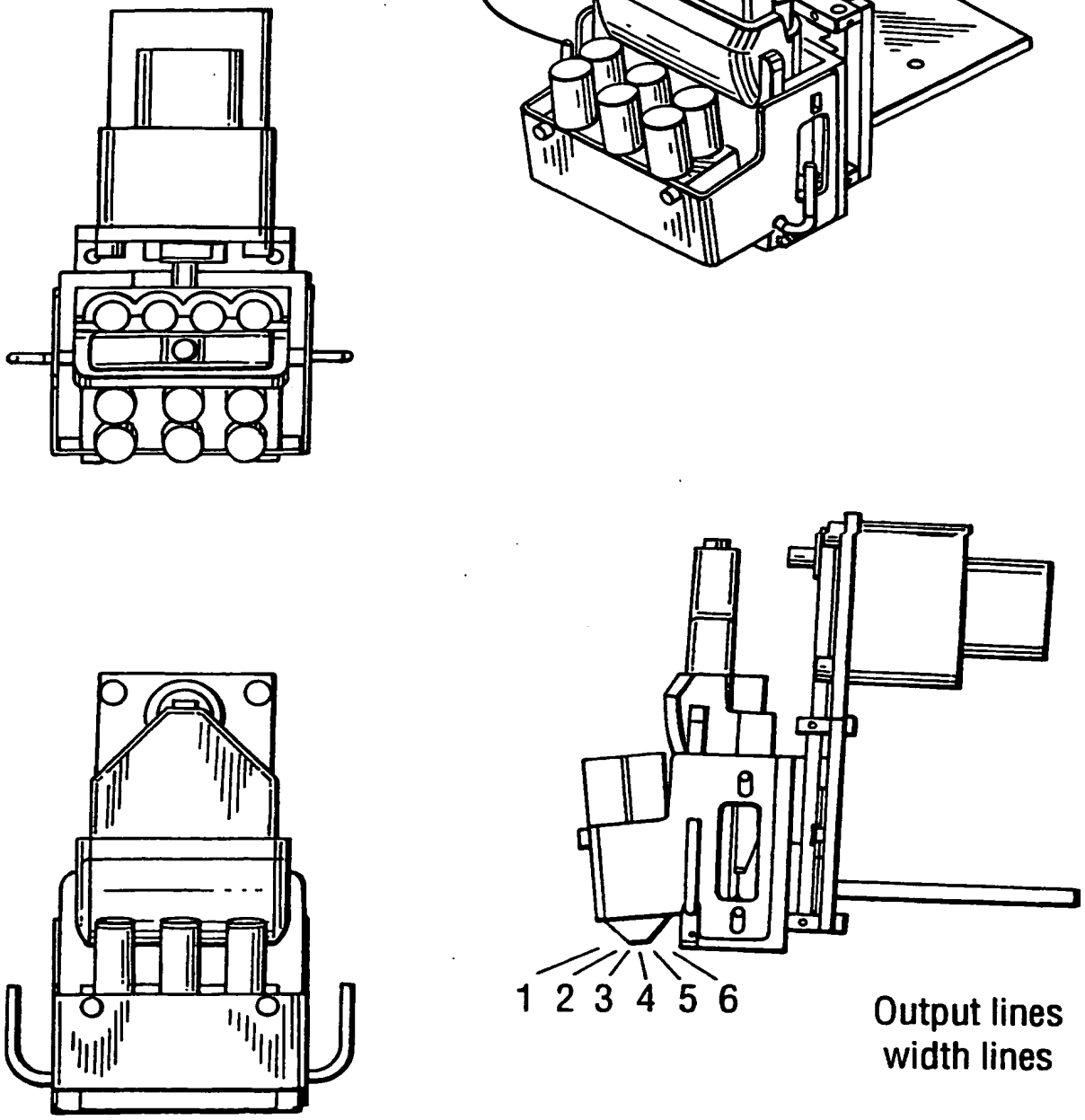

280 mm/s
2.8mm
Scale:
10mm
280 mm/s
2.8mm
Scale:
10mm
Time (mS)
100
90
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150

FIG. 5a

FIG. 5b



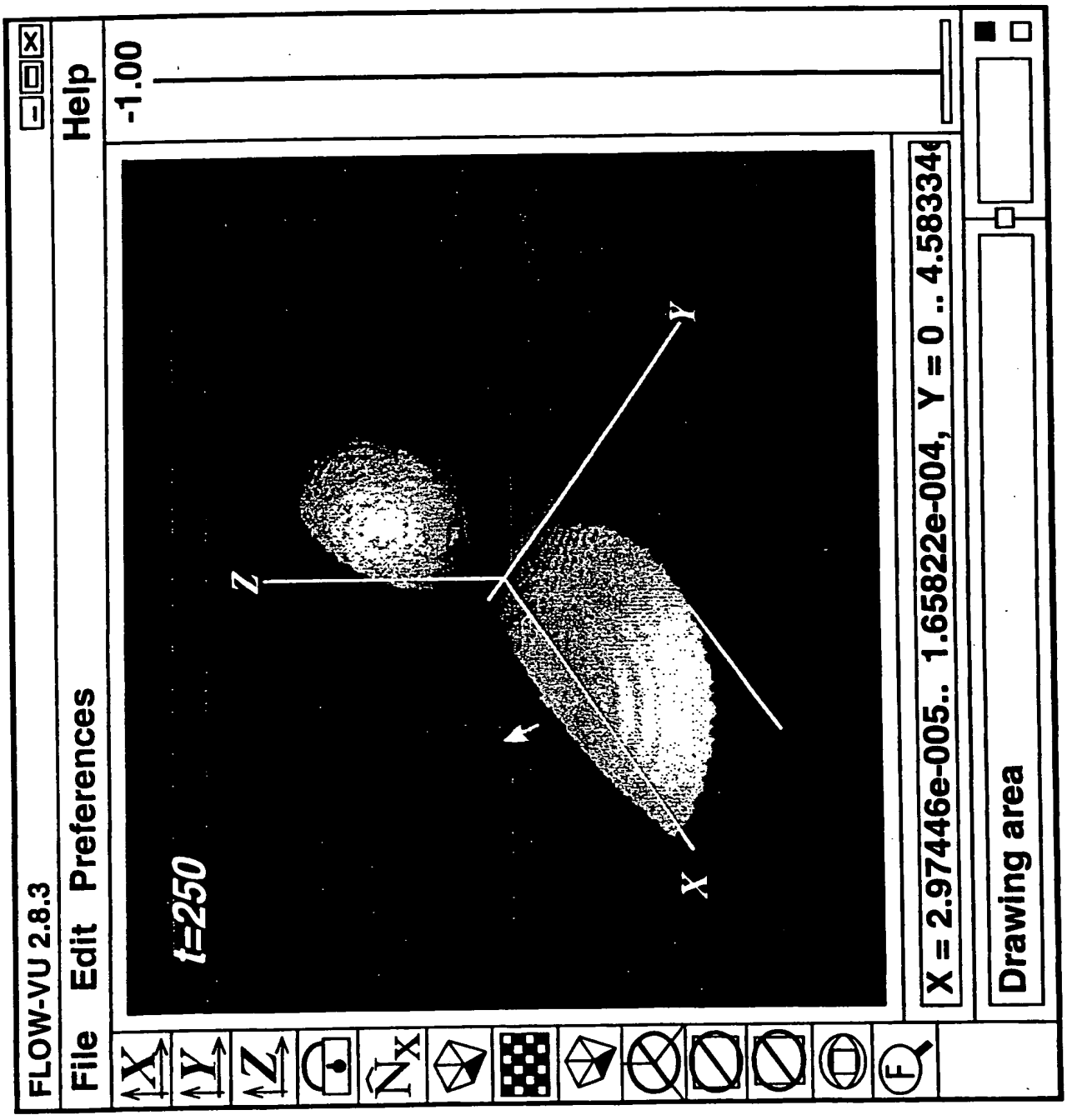

FLOW-VU 2.8.3
File Edit Preferences Help
-1.00
t=250
Z
Y
X
X = 2.97446e-005.. 1.65822e-004, Y = 0 .. 4.58334
Drawing area

FIG. 6

9/17

FIG. 7

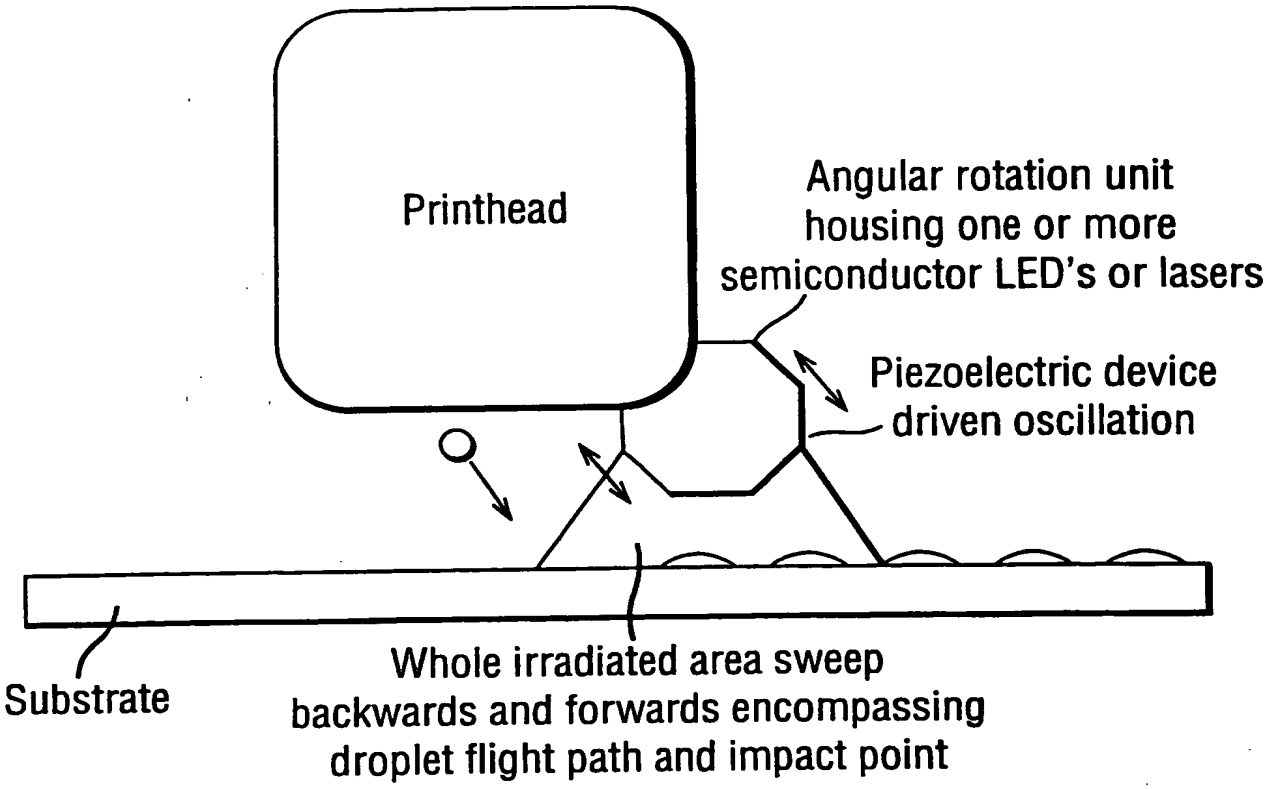


FIG. 8

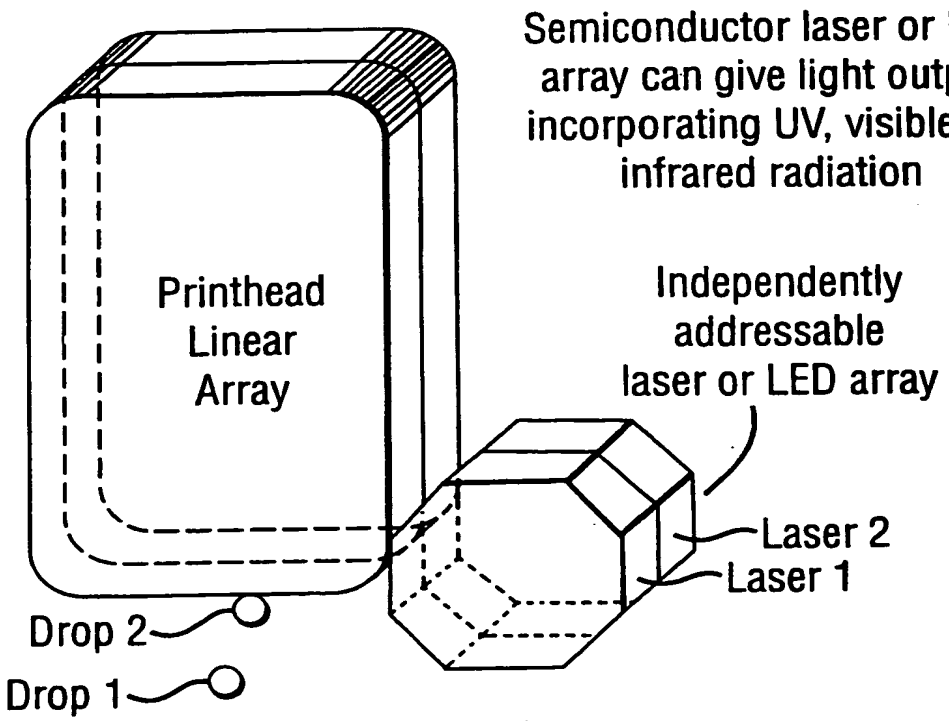


FIG. 9

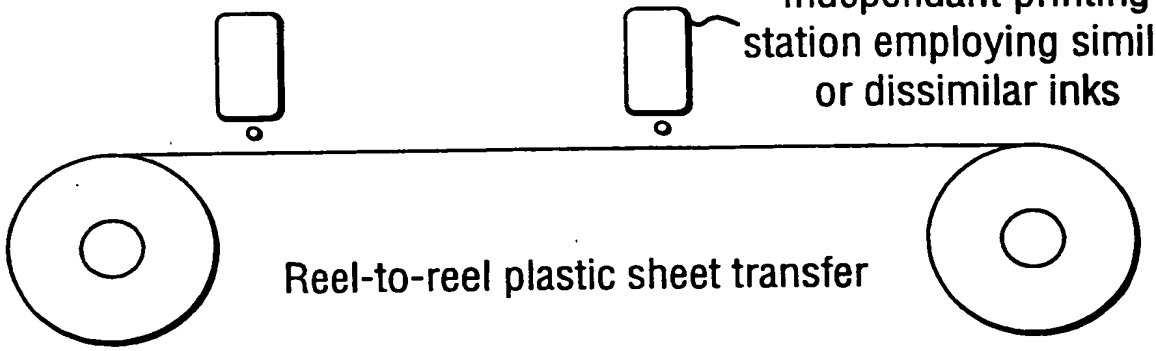


FIG. 10

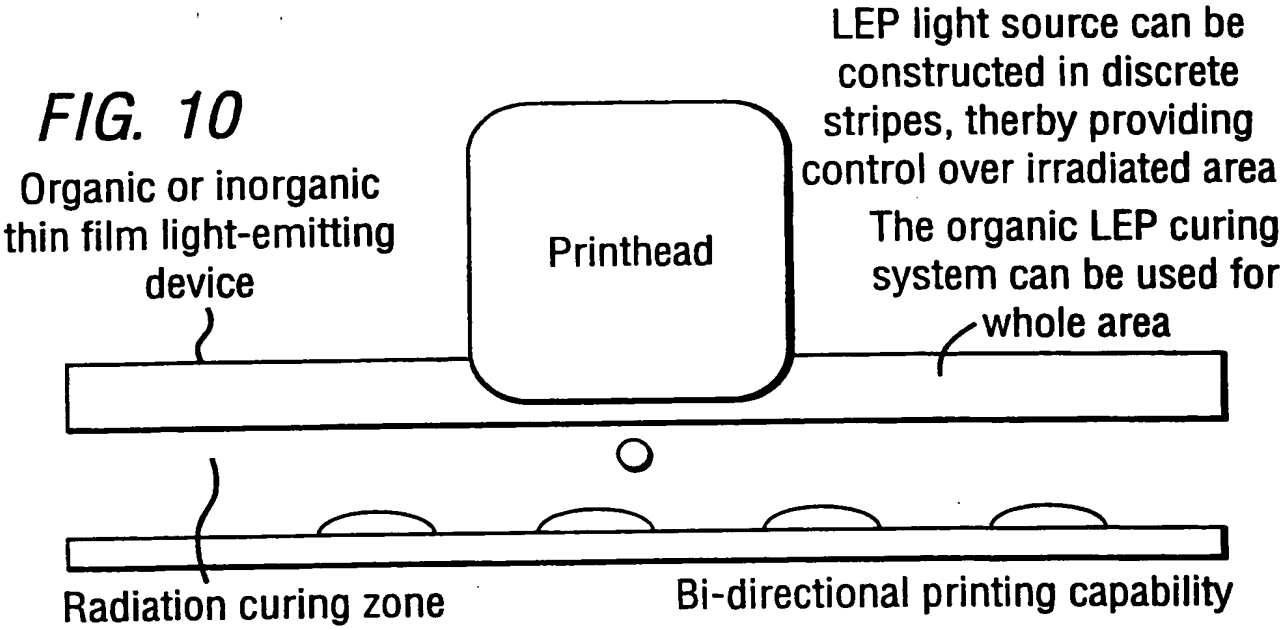
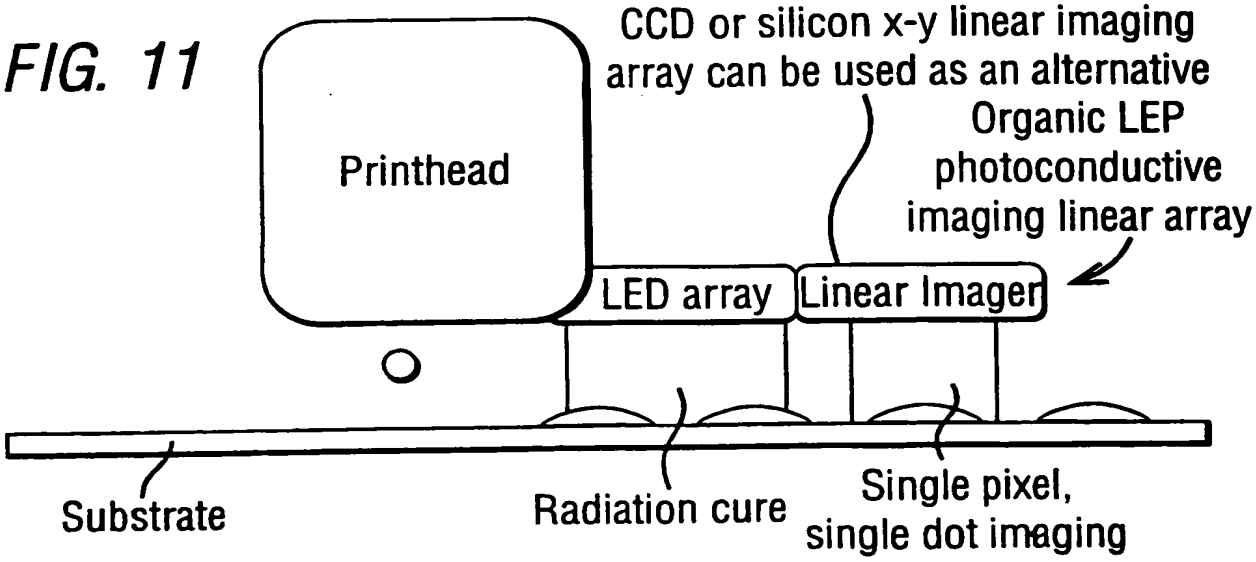


FIG. 11



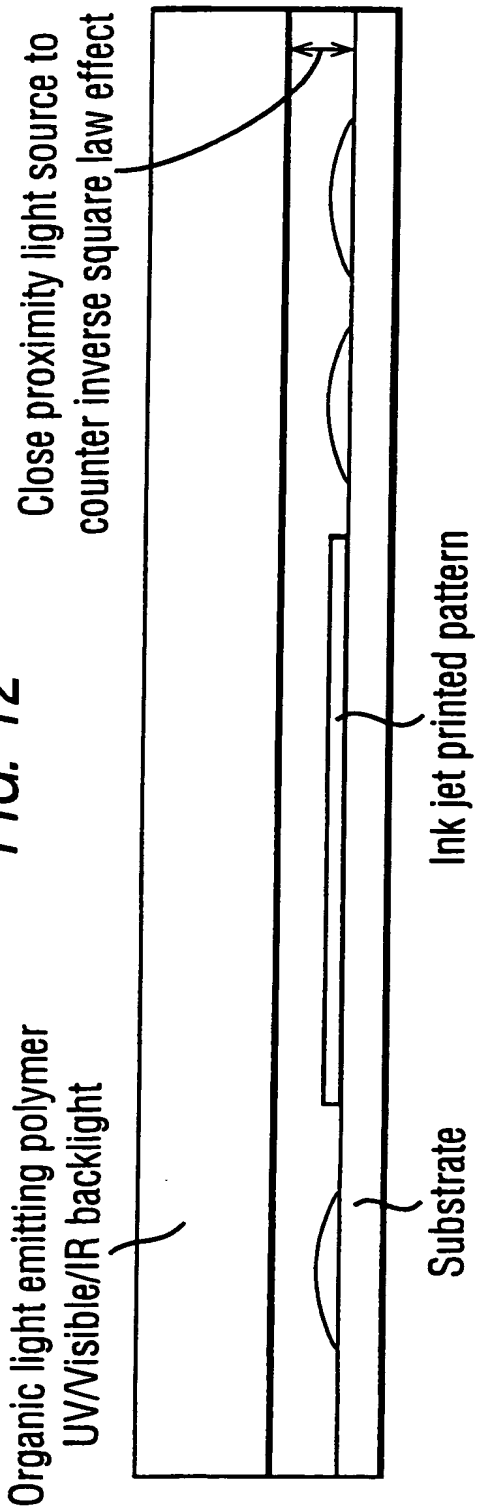

Close proximity light source to counter inverse square law effect
Ink jet printed pattern
Substrate
Organic light emitting polymer UV/Visible/IR backlight

FIG. 12

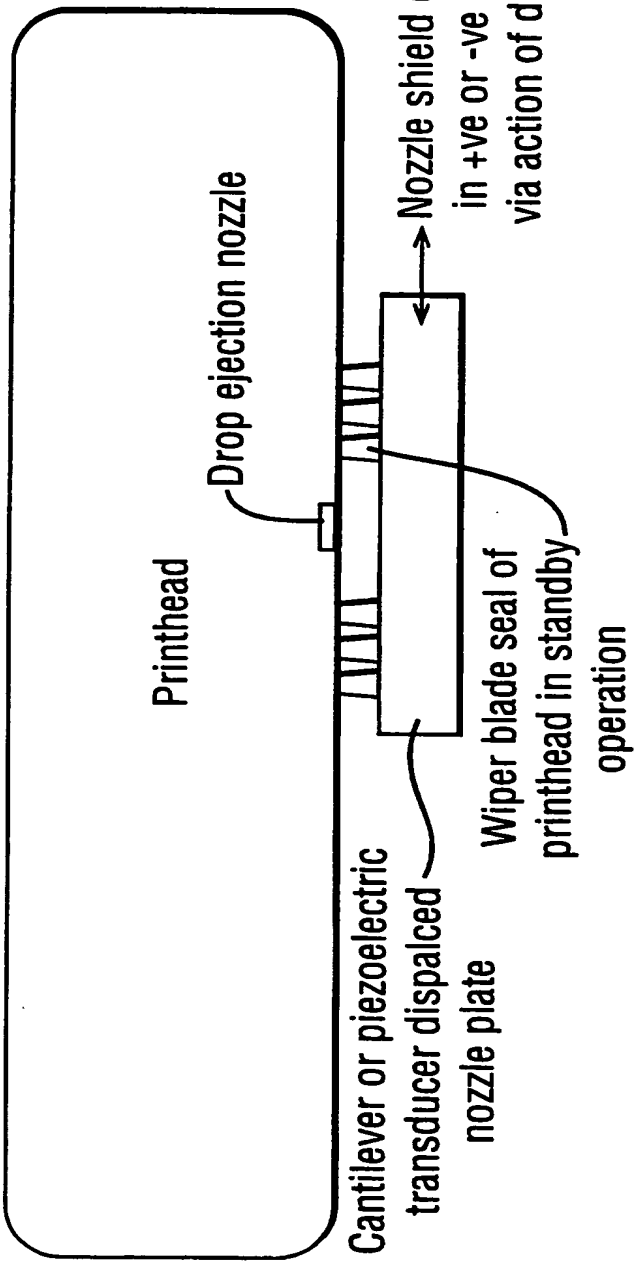

Printhead
Drop ejection nozzle
Nozzle shield can move in +ve or -ve direction via action of drive pulse
Wiper blade seal of printhead in standby operation
Cantilever or piezoelectric transducer dispalced nozzle plate

FIG. 13

FIG. 14

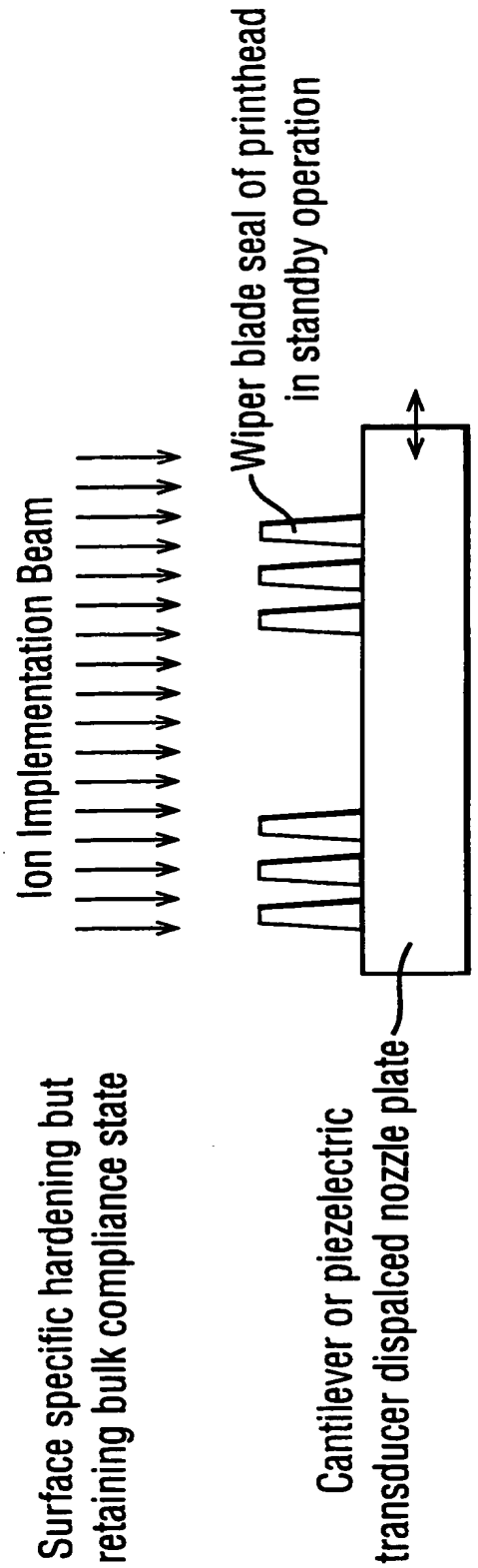
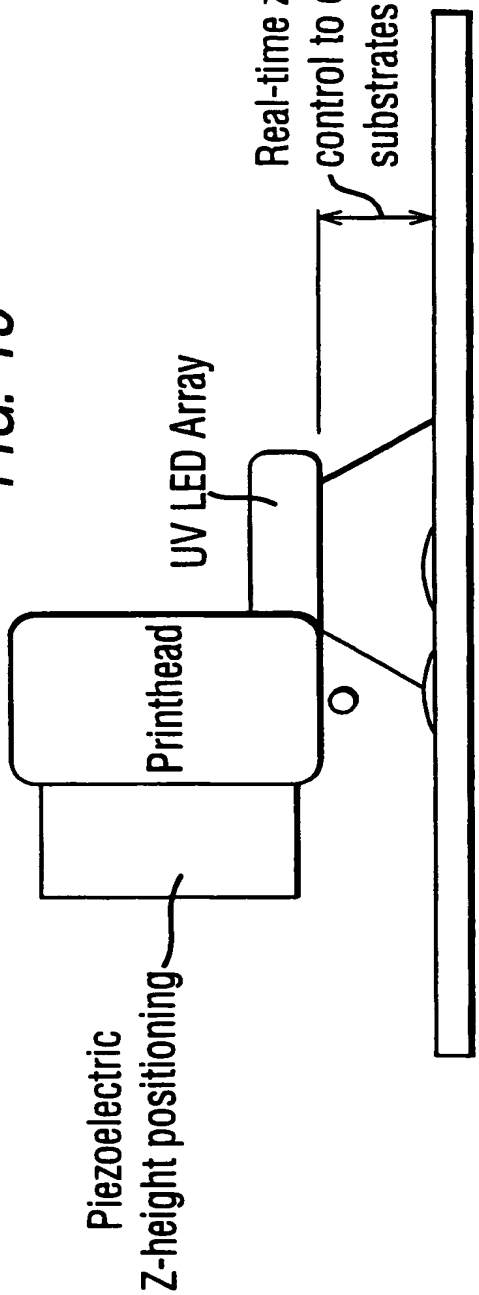

Ion Implementation Beam
Surface specific hardening but retaining bulk compliance state
Wiper blade seal of printhead in standby operation
Cantilever or piezelectric transducer dispalced nozzle plate

FIG. 15


Real-time z height feed-back control to cater for non-parallel substrates or surfaces
UV LED Array
Printhead
Piezoelectric Z-height positioning

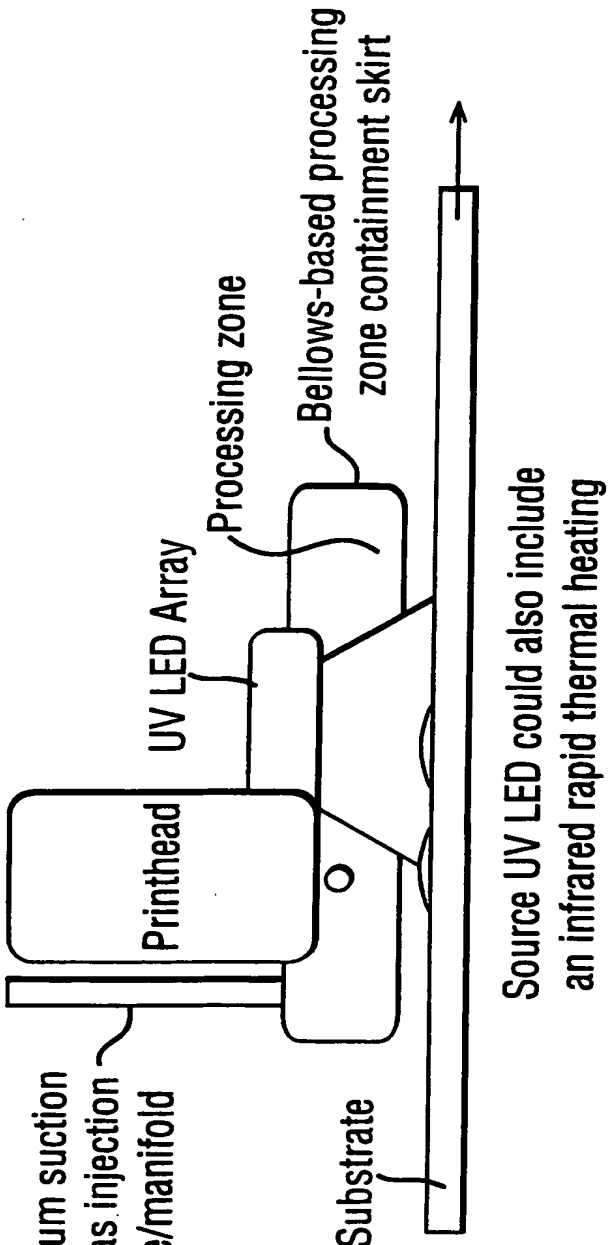

Vacuum suction
or gas injection
pipe/manifold
Printhead
UV LED Array
Processing zone
Bellows-based processing
zone containment skirt
Substrate
Source UV LED could also include
an infrared rapid thermal heating

FIG. 16

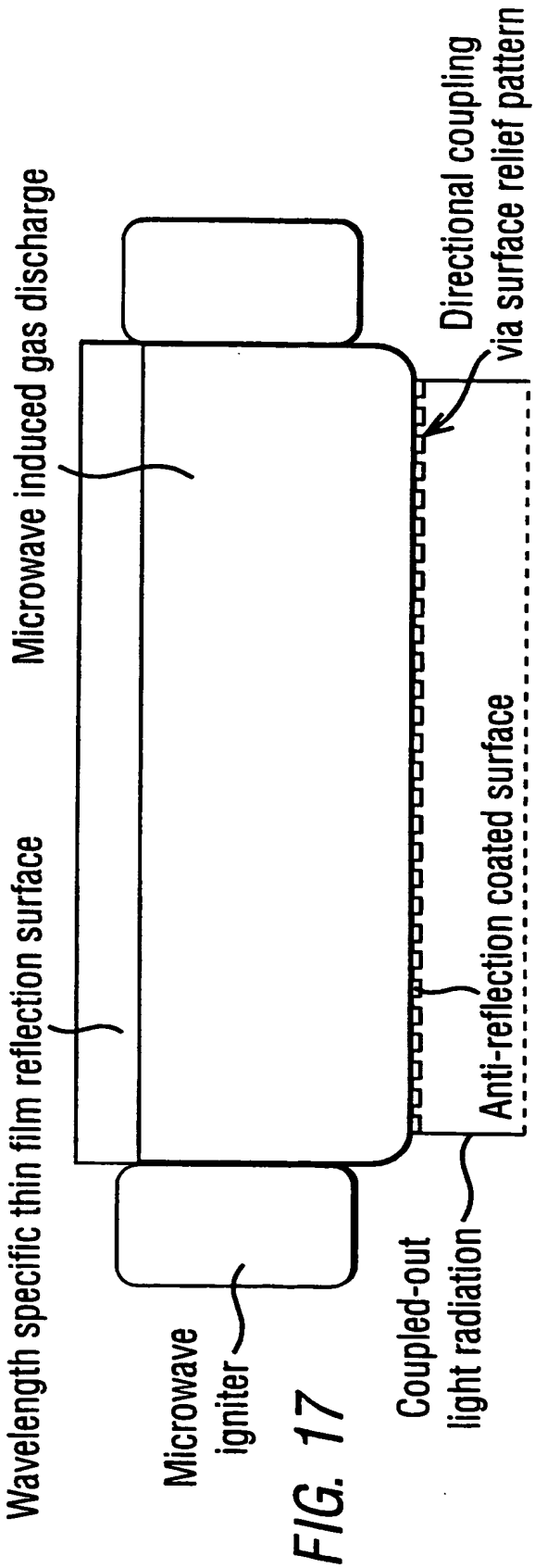

Wavelength specific thin film reflection surface
Microwave induced gas discharge
Directional coupling
via surface relief pattern
Anti-reflection coated surface
Microwave
igniter
Coupled-out
light radiation

FIG. 17

FIG. 18

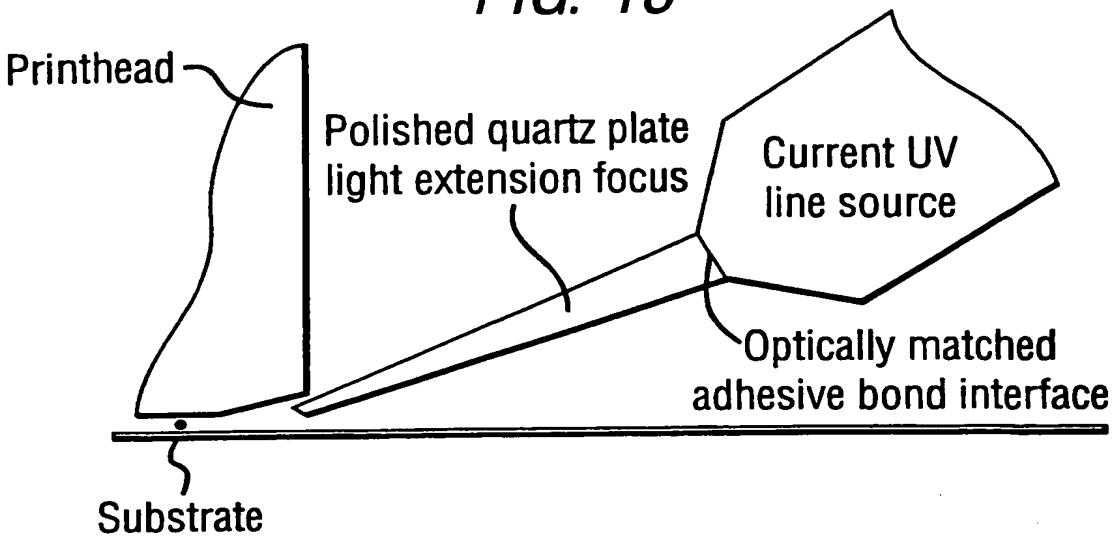


FIG. 19

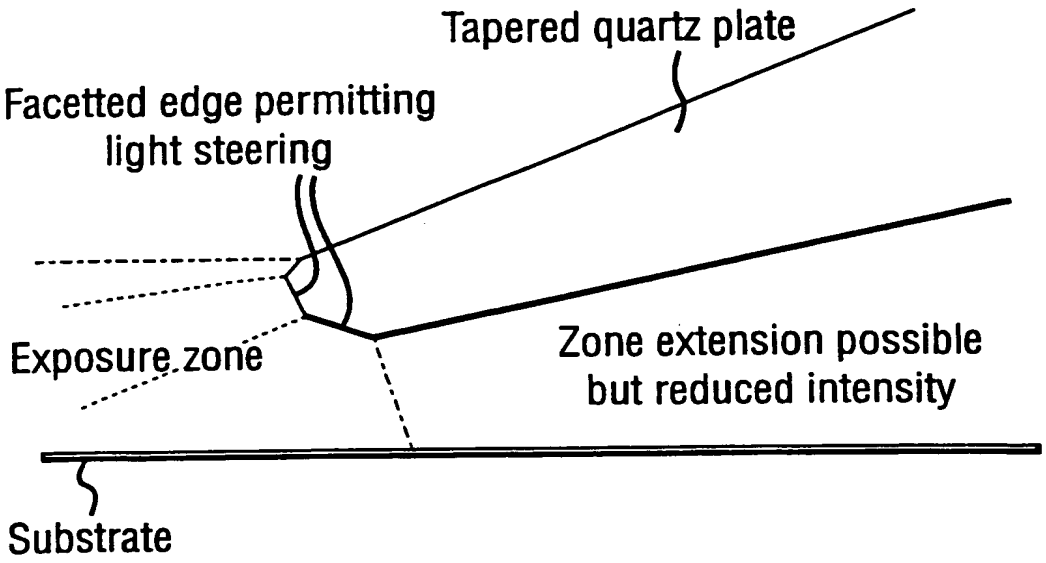


FIG. 20

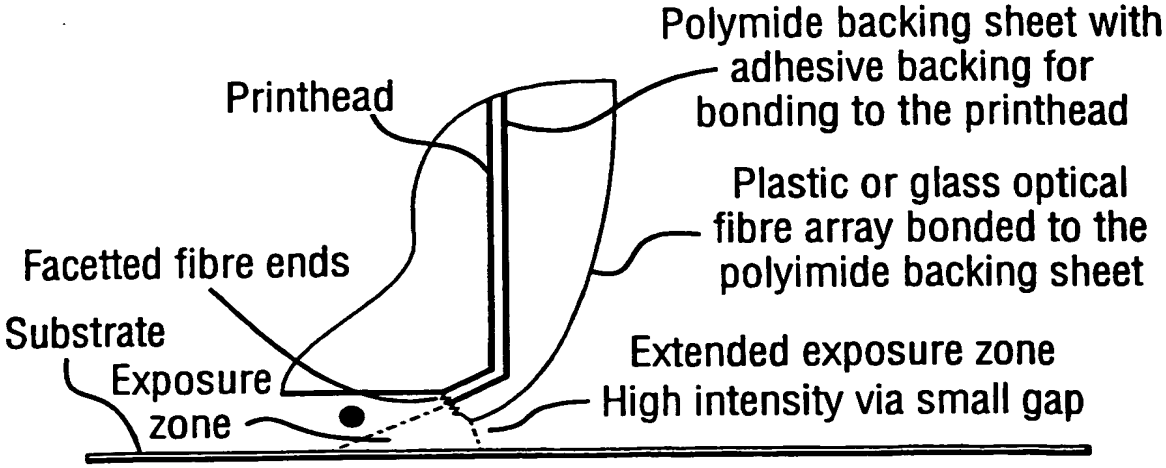


FIG. 21

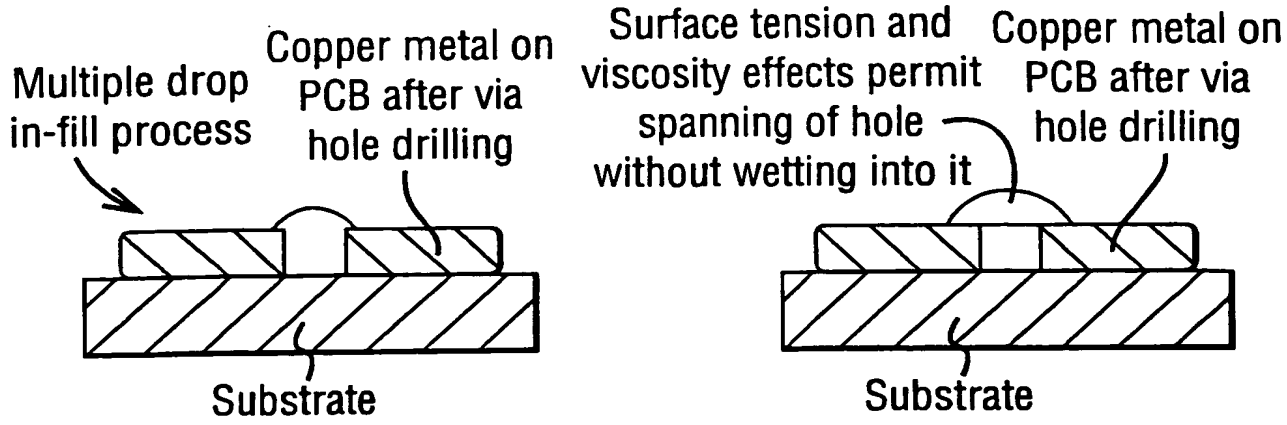
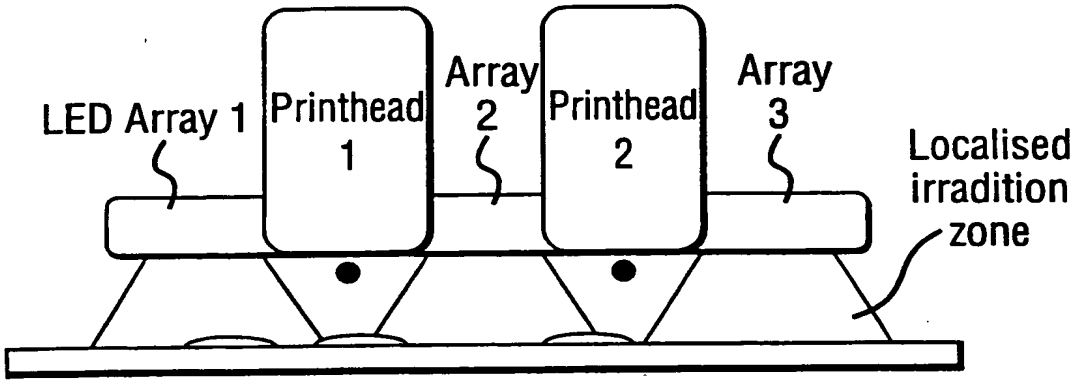


FIG. 22



Bi-directional printing

FIG. 23

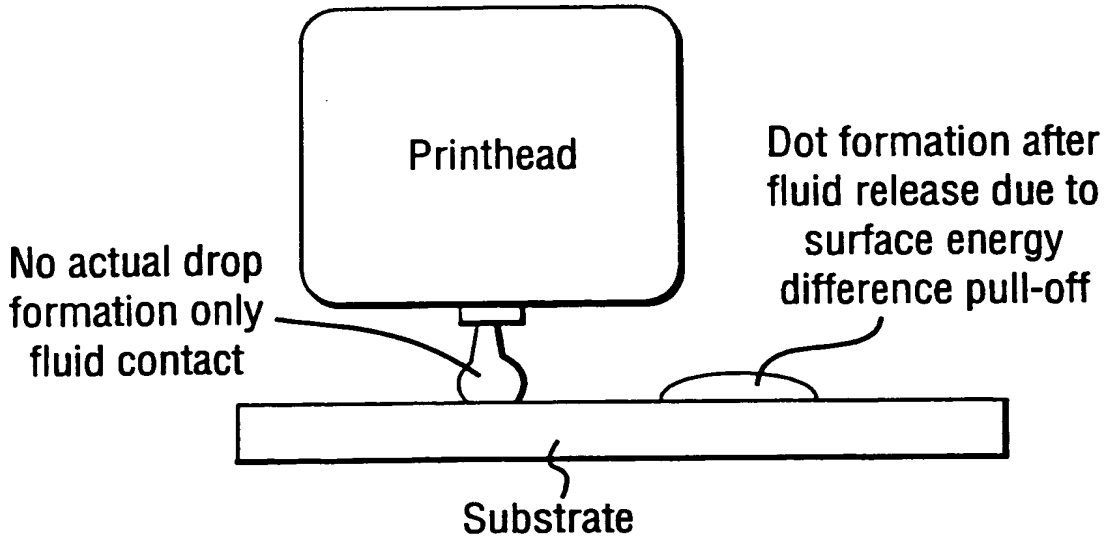


FIG. 24

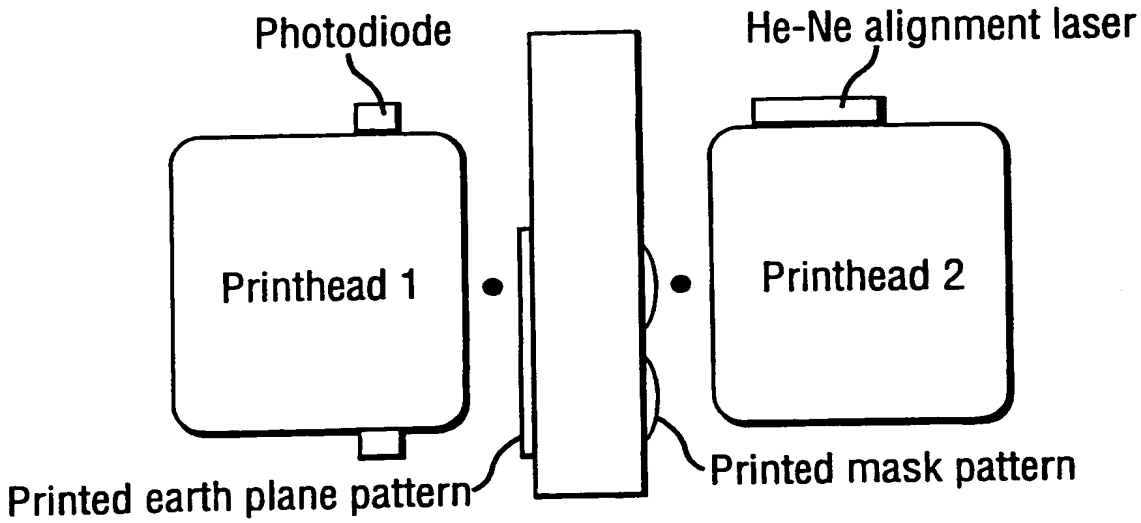

Photodiode
He-Ne alignment laser
Printhead 1
Printhead 2
Printed earth plane pattern
Printed mask pattern

FIG. 25

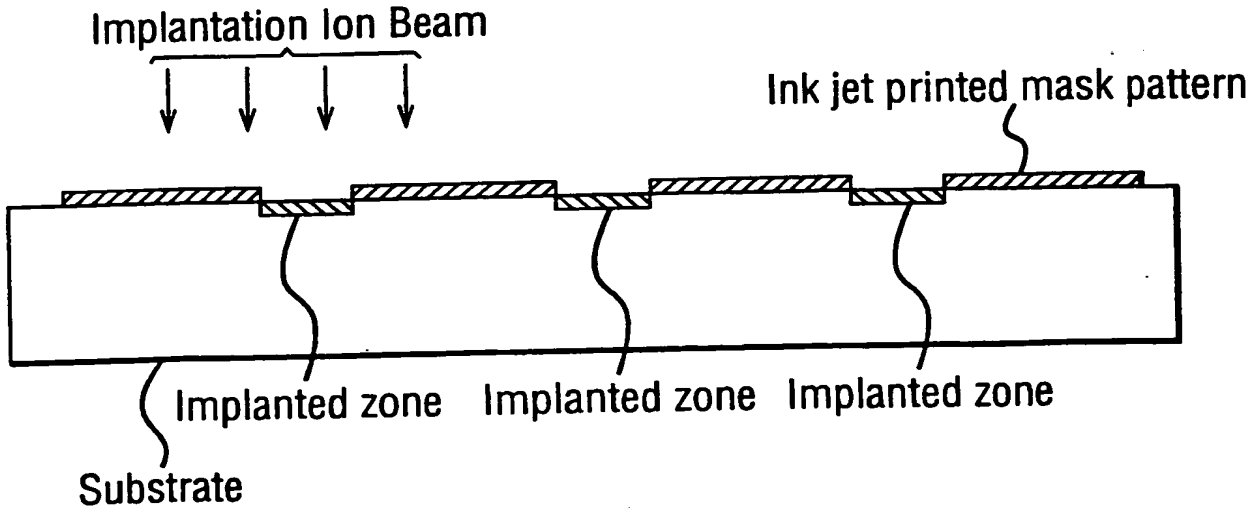

Implantation Ion Beam
Ink jet printed mask pattern
Implanted zone
Implanted zone
Implanted zone
Substrate

FIG. 26

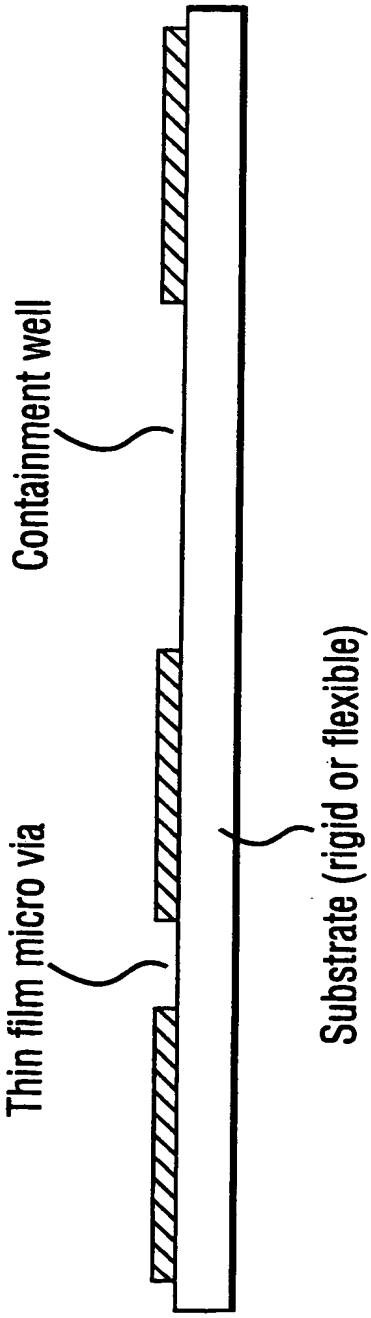
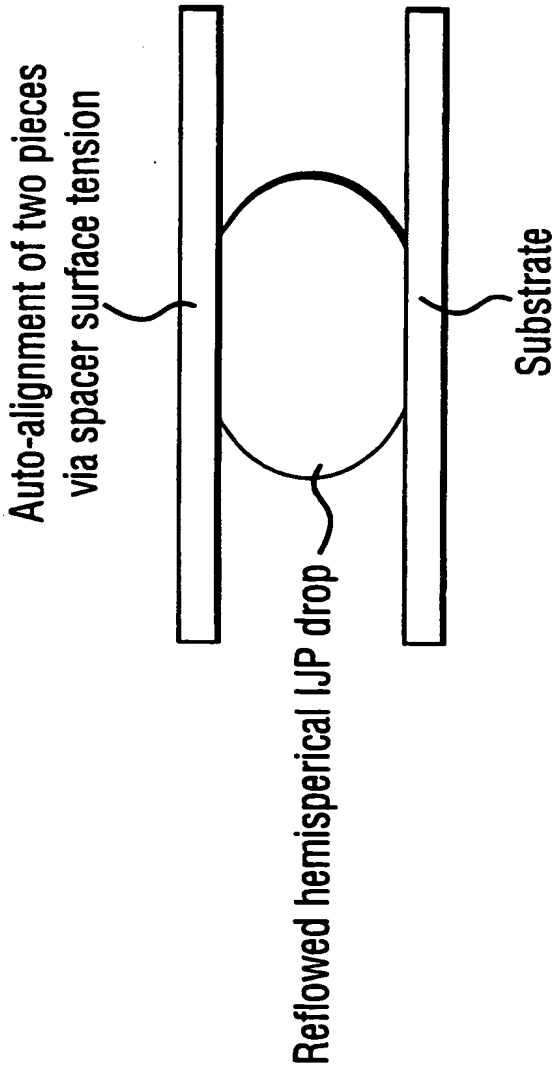

Containment well
Thin film micro via
Substrate (rigid or flexible)

FIG. 27


Auto-alignment of two pieces via spacer surface tension
Substrate
Reflowed hemisperical IJP drop